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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/676,875

09/30/2003

Jeffrey F. DeNatale

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12/13/2005

KOPPEL, JACOBS, PATRICK & HEYBL

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SUITE 107

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EXAMINER

ROJAS, BERNARD

ART UNIT

PAPER NUMBER

2832

DATE MAILED: 12/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/676,875

Applicant(s)

DENATALE ET AL.

Examiner

Bernard Rojas

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-34 is/are pending in the application.
- 4a) Of the above claim(s) 18-20 and 22-34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-17 is/are rejected.
- 7) ☒ Claim(s) 21 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 09302003, 01202004
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to the pending claims have been considered but are moot in view of the new ground(s) of rejection.

The indicated allowable subject matter of claims 2 and 7 is withdrawn. Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 2, 21 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear what claim limitation Applicant is claiming "said switch input lines designed such that the inductance of each switch input line is matched to its effective capacitance at a given design frequency".

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 2, 3, 4 and 6 are rejected under 35 U.S.C. 102(e) as being anticipated by Vaitkus et al. [US 2003/0179058 A1].

Claim 1, as best understood, Vaitkus et al. discloses a 1:N micro-electromechanical (MEM) switch module [700, figure 6], comprising: a substrate, a signal input line [704] on said substrate for receiving a signal to be switched, and N MEM switches [702] on said substrate, each of said switches having an input contact and an output contact on said substrate which are separated by a gap [figure 7], and a movable contact [cantilever 102, figure 2] which provides an electrically continuous signal path between said input and output contacts when said switch is actuated, each of said input contacts connected to said signal input line via respective switch input lines and each of said output contacts connected to respective signal output lines [figure 7].

Claim 3, Vaitkus et al. discloses the switch module of claim 1, wherein at least one of said signal output lines includes one or more open stub sections [the gap between the signal line and the output line for the outputs which are not selected] which effect the matching of said signal output line's inductance to its effective capacitance.

Claim 4, Vaitkus et al. discloses the switch module of claim 1, wherein said signal input line has a terminus point [in the center of the 4 Mem switches where in input signal line divides in two] and each of said switch input lines is connected to said signal input line at said terminus point, all N of said MEM switches arranged symmetrically about said terminus point [figure7].

Claim 6, Vaitkus et al. discloses the switch module of claim 1, wherein each of said MEM switches is an ohmic-contact switch which provides a conductive path upon closure [paragraph 23]

Claim Rejections - 35 USC § 103

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5 and 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vaitkus et al. [US 2003/0179058 A1].

Claim 5, Vaitkus et al. discloses that 4 Mem switches can be arranged in different configurations [figures 6 and 7] while still performing the same function. It would have been obvious to one of ordinary skill in the art at the time the invention was made to

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arrange the Mem switches into any other geometric pattern, along four sides of a pentagon centered about said terminus point, said signal input line bisecting the fifth side of said pentagon en route to said terminus point. Since applicant has not disclosed that placing the Mem switches in a pentagon geometry solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with the two geometries taught by Vaitkus et al.

Claim 13, Vaitkus et al. discloses the claimed invention except for the thickness of the substrate. It would have been obvious to one of ordinary skill in the art at the time the invention was made to change the thickness of the substrate, since applicant has not disclosed that s thickness of 5-10 mils solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with a substrate of any thickness.

Claims 14-17, Vaitkus et al. discloses the claimed invention except for the type of substrate used. It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary the substrate material depending on the desired electrical characteristics, since applicant has not disclosed that using any particular substrate solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with any substrate.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vaitkus et al. [US 2003/0179058 A1] in view of Ma [US 6,529,093].

Vaitkus et al. discloses the claimed invention with the exception of wherein each of said MEM switches is a capacitive switch that couples an applied signal between said input and output contacts through a thin insulator layer upon closure.

Ma discloses the use of a Mem switch with an Rf [capacitive switch signal] that uses a dielectric layer to prevent the input and output contact from physically contacting on another in order to prevent a DC short [col. 3 lines 15-26 and col. 4 lines 4-30].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a dielectric layer between the input and output contact of Vaitkus et al. in order to prevent a short circuit as taught by Ma.

Claims 2, 3, 6, 8-12 and 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Qiu et al. [US 6,016,092].

Claims 2 and 6, Qiu et al. discloses 1:N micro-electromechanical (MEM) switch module [figure 8a], comprising: a substrate, various input lines on said substrate for receiving signals to be switched between an output line, and N MEM switches [124, 125, 126] on said substrate, each of said switches having an input contact and an output contact on said substrate which are separated by a gap [123], and a movable contact [125] which provides an electrically continuous signal path between said input [122] and output [121] contacts when said switch is actuated, each of said input contacts connected to said signal input line via respective switch input lines and each of said output contacts connected to respective signal output lines [figure 8c].

Qiu et al. fails to teach switching an input signal between various outputs.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to reverse the direction of the signal in order to route an input signal between various outputs, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

Claim 3, Qiu et al. discloses the switch module of claim 1, wherein at least one of said signal output lines includes one or more open stub sections [the gap between the signal line and the output line for the outputs which are not selected] which effect the matching of said signal output line's inductance to its effective capacitance.

Claims 8, 10 and 11, Qiu et al. discloses using magnetic Mem switches in order switch the signal. It would have been obvious to one of ordinary skill in the art at the time the invention was made to change the actuation method of the Mem switch, electrostatic, thermal, piezoelectric in order to tailor the switch to the environment in which it is to be used. Using an electrostatic or piezoelectric switch eliminates EM interference created by the magnetically actuated Mem switch. Using a thermally activated switch removes the need of creating a coil and the circuitry required to activate the coil.

Claim 9, Qiu et al. discloses the switch module of claim 8, wherein said drive voltages are applied to at least some of said movable contacts using air bridges which traverse signal lines or traces on said substrate [figure 8c].

Claim 12, Qiu et al. discloses the switch module of claim 1, wherein each of said MEM switches is actuated with a respective drive voltage applied between said movable contact [125] and at least one corresponding trace [126] on said substrate, each of said

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corresponding traces connected to a via [127], said vias arranged symmetrically about said terminus point such that at least some of said vias are shared by adjacent ones [128] of said MEM switches.

Claims 14-17, Qiu et al. discloses the claimed invention except for the type of substrate used. It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary the substrate material depending on the desired electrical characteristics, since applicant has not disclosed that using any particular substrate solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with any substrate.

Allowable Subject Matter

Claim 21 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard Rojas whose telephone number is (571) 272-1998. The examiner can normally be reached on M-F 8-4:00), every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Elvin G. Enad can be reached on (571) 272-1990. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Donald R. ...
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[Signature]
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